

A LITHOGRAPHIC PROJECTION APPARATUS, A GRATING MODULE, A SENSOR  
MODULE, A METHOD OF MEASURING WAVE FRONT ABERRATIONS

**ABSTRACT**

A lithographic projection apparatus comprising an illumination system; a support structure for holding a mask; a substrate table for holding a substrate; a projection system for projecting a pattern onto a target portion of the substrate; and an interferometric measurement system for measuring wave front aberrations of the projection system, characterized in that the interferometric measurement system comprises: a grating, featuring a grating pattern in a grating plane, said grating being movable into and out of the projection beam, such that the grating plane is substantially coincident with said object plane; a pinhole, featuring a pinhole pattern in a pinhole plane and arranged in a pinhole plate, said pinhole being movable into and out of the projection beam, such that the pinhole plane is substantially coincident with a plane downstream of the projection system and optically conjugate to said object plane, and a detector with a detector surface substantially coincident with a detection plane, said detection plane located downstream of the pinhole at a location where a spatial distribution of the electric field amplitude of the projection beam is substantially a Fourier transformation of a spatial distribution of the electric field amplitude of the projection beam in the pinhole plane.